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Executive Summary

Former S & S Cleaners and Dyers Site

13 Willow Street

Cohoes, New York

Site # 401063

Work Assignment # D-007618-1

September 2012

ARCADIS

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Executive Summary

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Site # 401063

Work Assignment # D-007618-1

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1. Introduction

On behalf of the New York State Department of Environmental Conservation (NYSDEC), Malcolm Pirnie, Inc. (Malcolm Pirnie) has prepared this Executive Summary for investigation activities at the former S & S Cleaners and Dyers Site, in Cohoes, Albany County, New York (site) (Figures 1 and 2). Based on the previous discovery of chlorinated solvents in the soil, groundwater, and soil vapor at the site, the nature and extent of the release and potential for soil vapor intrusion into area properties will be assessed during the investigation. This Executive Summary presents the understanding of site conditions to-date, site characterization approach, and field tasks that will guide the field work.

1.1 Site Location and Background

The former S & S Cleaners and Dyers Site located at 13 Willow Street, in the northern portion of the City of Cohoes (City) (Figure 1), consists of a vacant lot that was once a dry cleaning facility. The ground surface over the majority of the site is composed largely of gravel with minor asphalt paved areas. The site is flat with the exception of the rear approximately one-quarter of the parcel which slopes upward to a retaining wall up to five feet above the elevation of the remainder of the parcel. The site is located within a mixed residential-commercial neighborhood adjacent to the North Mohawk Street area of the City. The North Mohawk Street area is dominated by the former Harmony Mills textile complex and is one of the City's primary redevelopment target areas. The site is bordered by Willow Street and Worth Street to the east and west, respectively, and residential properties to the north and south. The City of Cohoes acquired the property through tax foreclosure in 1993. The building on the site was demolished in 2000. The property is currently used as an informal parking lot.

1.2 Previous Investigations

The City of Cohoes received a grant under the United States Environmental Protection Agency's (USEPA) Brownfields Assessment Program to support economic development in the City through the identification, assessment, cleanup, and redevelopment of Brownfields properties. During the process of screening City-owned properties to assess where further investigation would be warranted, environmental database and historical city directory searches were conducted. Review of these historical data and local knowledge identified the 13 Willow Street site as a dry cleaning facility owned and occupied by S&S Cleaners from at least 1962 through 1976. The presence of a dry cleaning operation constitutes a recognized environmental condition as defined by the

American Society for Testing and Materials (ASTM) Standard E 1527-05 guideline for Phase I Environmental Site Assessments (ESAs). Given the historical environmental record of dry cleaning operations throughout the nation, there was a potential for soil and groundwater contamination at this and surrounding properties resulting from the release of chlorinated dry cleaning solvents. In addition, there was also a potential for vapor intrusion into the surrounding structures from any subsurface contamination. Consequently, the City proceeded directly to a Phase II ESA at the site.

On behalf of the City of Cohoes, Malcolm Pirnie conducted a Phase II ESA at the site in 2009 (Malcolm Pirnie, 2009). Chlorinated volatile organic compounds (CVOCs) were found to be present in the subsurface soil, groundwater, and soil vapor at the site. One groundwater sample from the site contained tetrachloroethene (PCE) at a concentration greater than the corresponding NYSDEC Class GA Standard. The two on-site soil vapor samples contained PCE and trichloroethene (TCE) at elevated concentrations. These findings were reported to the NYSDEC Spill Hotline in March 2009 and Spill number 0814131 was issued for the site.

In November 2009, at the request of the NYSDEC and New York State Department of Health (NYSDOH), soil vapor intrusion evaluations were conducted at the adjacent properties to the north (9 Willow Street) and south (17 Willow Street) of the site. Additionally, a supplemental round of groundwater samples was collected from each of the five existing monitoring wells (Malcolm Pirnie, 2010a). PCE was detected at elevated concentrations in the basement and indoor air samples from 17 Willow Street and the sub-slab and basement air samples from 9 Willow Street. One groundwater sample, from well MW-2, contained PCE at a concentration greater than the corresponding NYSDEC Class GA Groundwater Standard. The concentration of PCE in the sample from MW-2 was consistent with that of the March 2009 Phase II ESA sampling. The NYSDEC and NYSDOH determined that vapor intrusion mitigation was necessary at 9 and 17 Willow Street.

In May 2010, at the request of the NYSDEC and NYSDOH, a soil vapor intrusion evaluation was conducted at 19/21 Willow Street. Additional soil, groundwater, and soil vapor sampling was also conducted (Malcolm Pirnie, 2010b). PCE was detected in the sub-slab and basement air at elevated concentrations, however, the NYSDEC and NYSDOH requested that additional indoor air samples be collected during the heating season to properly evaluate whether mitigation would be required at 19/21 Willow Street. PCE was detected at elevated concentrations in soil vapor samples collected along the Willow Street sewer line, suggesting that the sewer utility bedding material is acting as a preferential pathway for soil vapor migration. Soil samples from the northeast corner of

the site between seven and 10 feet below ground surface (bgs) contained PCE at concentrations up to three orders of magnitude greater than the corresponding 6 NYCRR Part 375 Residential Soil Cleanup Objective (SCO), suggesting that this portion of the site was a potential source area for soil vapor and groundwater contamination. The groundwater sample from well MW-7, within this area, contained PCE, TCE, cis-1,2-dichloroethene, chlorobenzene, 1,1-dichloroethene, and vinyl chloride at concentrations greater than the corresponding NYSDEC Class GA Groundwater Standards. The concentrations of PCE and TCE in the sample from MW-7 were greater than the NYSDEC Class GA Groundwater Standard by four and two orders of magnitude, respectively. The groundwater sample from down-gradient well MW-8 contained PCE (7 µg/L) and TCE (14 µg/L) at concentrations greater than the corresponding NYSDEC Class GA Groundwater Standards, indicating that CVOC-impacted groundwater has migrated off-site. Dissolved oxygen values between approximately 4.1 and 8.7 milligrams per liter (mg/L) and oxidation-reduction potential values between approximately 90 and 131millivolts (mV) measured at MW-6, MW-7, and MW-8 during groundwater purging suggest oxidizing subsurface conditions with limited potential to naturally degrade the CVOCs.

As directed by the NYSDEC and NYSDOH, the City installed soil vapor mitigation systems at 9 and 17 Willow Street in September 2010. A sub-slab depressurization system (SSDS) was installed at 9 Willow Street, which has a full-height basement with a concrete slab. At 17 Willow Street, which has a low-height basement with dirt floor, a sub-membrane depressurization system was installed by placing air extraction piping beneath an EPDM membrane sealed to the building foundation. Differential pressure testing conducted in November 2010 verifying the efficacy of the systems was performed and the results of the testing were sent to the NYSDEC and NYSDOH along with the final system layouts. Testing results are shown on Figures 3 and 4. System information is provided in Appendix A.

In November 2010, at the request of the NYSDEC and NYSDOH, additional indoor air sampling was conducted at 19/21 Willow Street and an additional round of groundwater samples was collected from the three new wells, MW-6, MW-7, and MW-8, installed in May 2010 (Malcolm Pirnie, 2011). PCE was detected at a low concentration in the air sample from the basement of the 19 Willow Street (northern) side of the building. The NYSDEC and NYSDOH determined that vapor intrusion mitigation was not required for this property. The groundwater sample from well MW-7, contained PCE, TCE, cis-1,2-dichloroethene, chlorobenzene, 1,1-dichloroethene, and vinyl chloride at concentrations greater than the corresponding NYSDEC Class GA Groundwater Standards. The groundwater samples from wells MW-6 and MW-8 did not contain CVOCs at

concentrations greater than the corresponding NYSDEC Class GA Groundwater Standards.

Figures 5, 6, and 7 summarize the soil, groundwater, and soil vapor/indoor air sampling results, respectively, for samples collected during the Phase II ESA and subsequent sampling rounds.

In May 2011 spill number 0814131 was closed following the transfer of the site into the Inactive Hazardous Waste Site Program.

1.3 Geology/Hydrogeology

The Ordovician Normanskill Shale and Austin Glen Formations, consisting largely of shale, are present beneath the site and the surrounding area (Fisher et al., 1970). Bedrock was not encountered during the Phase II ESA or subsequent investigative activities. Drivepoints advanced to refusal at the site suggest that bedrock is present at an approximate depth of 27 feet below ground surface (bgs). Off-site, refusal was reached at depths of approximately 18 (till) and 20 feet (bedrock) bgs at well locations MW-4 and MW-5, respectively. Natural overburden materials in the area are characterized as lacustrine silt and clay (Caldwell et al., 1987). Overburden materials observed during the Phase II ESA and subsequent investigations were generally composed of urban fill material overlying clay and silt. Groundwater flow at the site is generally to the north toward the Mohawk River, which is the regional groundwater discharge.

2. Site Investigation

The scope of work for the site investigation is designed to further characterize the magnitude and extent of contaminants associated with the former dry cleaning operations (i.e., chlorinated VOCs [CVOCs]), the potential for off-site migration of contaminants, and the potential for vapor intrusion. The base scope of work includes:

- Direct-push soil borings;
- Soil sampling;
- Installation of additional soil vapor points;
- Installation of additional groundwater monitoring wells;

- Groundwater sampling;
- Interim remedial measures in the form of source area excavation; and
- Soil vapor intrusion evaluation, and mitigation, if required.

An analytical laboratory approved by the New York State Department of Health (NYSDOH) under the Environmental Laboratory Approval Program (ELAP) will analyze all samples collected during the investigation. Analytical results will be reported in ASP Category B data packages. A Data Usability Summary Report (DUSR) will be prepared upon the receipt of all analytical data to ensure that the quality of the data is sufficient to evaluate remedial alternatives. Sample collection, handling activities, and QA/QC sampling will be conducted in accordance with Malcolm Pirnie's Generic Quality Assurance Project Plan (QAPP), which has previously been submitted to the NYSDEC for work conducted under the NYSDEC State Superfund Standby Contract No. D007618.

2.1 Subsurface Sampling

Subsurface soil samples will be collected from eight locations at the site, the adjacent property to the north, and the Willow Street right-of-way (ROW) as shown on Figure 8, to further delineate CVOCs in the suspected source area. Normal utility clearance activities, consisting of reviewing available site drawings and contacting Dig Safely New York, will be conducted prior to beginning the subsurface investigation.

2.1.1 Soil Borings

Soil borings will be drilled using direct-push drilling methods. Soil samples will be collected continuously from the ground surface to the final depth of each boring using a macro-core sampler. Upon retrieval, each macro-core will be opened and the soil will be screened using a photoionization detector (PID), visually inspected for indications of contamination (e.g., staining and/or sheens) and buried debris, and classified by the on-site field geologist. The final depth of each boring will be dependent on site-specific conditions.

2.1.2 Soil Sample Collection

Eight borings, as shown on Figure 8, will be drilled to evaluate the areas of concern on the site and adjacent properties. The borings will be advanced using direct-push drilling methods from ground surface to approximately 15 feet bgs. Up to five soil samples will be

collected from each boring for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) by USEPA Method 8260. One sample from each boring will also be analyzed for TCL semi-volatile organic compounds (SVOCs) by USEPA Method 8270, Target Analyte List (TAL) metals by USEPA Method 6010/7471, and polychlorinated biphenyls (PCBs)/pesticides by USEPA Methods 8082 and 8081, respectively. The removal and subsequent repair of the chain-link fence at 9 Willow St. will be required to allow for drilling access.

2.2 Soil IRM

An Interim Remedial Measure (IRM) will be conducted at the site, and adjacent property if necessary, to remove source material that is contributing to the off-site groundwater and soil vapor contamination. The IRM will consist of the excavation of soil above the water table that contains CVOCs at concentrations greater than the corresponding NYCRR Part 375 Residential Soil Cleanup Objectives (SCOs). The anticipated volume of soil to be excavated is approximately 100 cubic yards. The exact excavation volume will be determined based on soil delineation sampling described in Section 2.1 and excavation confirmation sampling. Soil removed during the IRM will be transported to a permitted facility for disposal in accordance with applicable federal, state, and local regulations. Confirmation soil sampling will be conducted to verify that the IRM objectives have been achieved.

The initial excavation limits are an approximately 15 x 35 foot area based on previous soil sampling results. The actual horizontal extent of the excavation will be based on the results of confirmation sampling conducted during the IRM. Because the greatest concentrations of CVOCs in soil are at 10 feet bgs, which is at or immediately below the water table, the vertical extent of the excavation is not planned to exceed the depth of the water table at the time of the IRM.

2.2.1 Specific Work Activities

The following specific work activities will be conducted during the remedial action at the excavation locations.

- **Excavation**: Prior to any excavation activity, underground utilities will be located and flagged to prevent accidental interruption of such services. Soil containing CVOC concentrations in excess of the Part 375 Residential SCOs will then be excavated to the initial limits described above.

- **Water Control**: The fill and grading will be implemented to direct water away from excavations. Drainage water will be disposed of in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with applicable requirements. Since the excavation will not exceed the depth of the water table, groundwater should not be encountered during the remedial action.

- **Air monitoring**: Monitoring for volatile vapors and airborne dust will be conducted using a respirable airborne dust monitor (MIE Miniram or equivalent) and a PID, respectively, during excavation activities. Monitored levels in excess of the action level established by the Safety Officer shall require mitigative action to lower dust levels. Dust control methods will include the periodic application of potable water.

- **Confirmation Testing**: Confirmation sampling will be conducted in accordance with DER-10 to evaluate whether all unsaturated soil with CVOCs concentrations greater than the SCOs have been excavated. Soil samples will be collected by the on-site engineer or geologist with the assistance of the contractor, if necessary. Each soil sample will be placed into laboratory-supplied, pre-cleaned sample jars, and placed into a cooler chilled with ice. Soil samples will be sent under chain-of-custody to an analytical laboratory for analysis of the TCL VOCs by USEPA Method 8260 under a 24-hour turnaround time. The contractor will be responsible for coordinating work in a manner that takes into account laboratory turnaround times and allows for additional excavation, if necessary.

- **Transport and Disposal**: Excavated soils will be placed into dump trailers for transport to the selected off-site disposal location. It is assumed that the soil between five feet bgs and the water table will be disposed of as an F002 hazardous waste based on known site history and previous sampling.

- **Backfilling**: Once testing results have confirmed that soil containing CVOCs at concentrations in excess of Part 375 Residential SCOs have been excavated, clean general fill and the upper five feet of excavated soil, if deemed acceptable, will be used to backfill the excavated area to finished grade. Backfill material will be tested to confirm that it does not contain any contaminants at concentrations greater than the corresponding Part 375 Residential SCOs before being placed in the excavation. Backfilled materials will be placed in lifts not to exceed 12 inches and backfilled areas will be compacted using a mechanical tamper or other approved device to prevent settling.

- **Site Restoration**: Prior to final demobilization from the site, the property will be restored to original condition or better. Areas of excavation will be backfilled and compacted to the final grades. All grassed areas will be re-seeded. Any paved areas disturbed during excavation will be resurfaced. Any fences removed or damaged during the remedial activities will be replaced. It is anticipated that monitoring well MW-7 will be removed during the IRM, and will be replaced at the conclusion of the IRM activities.

2.3 Vapor Intrusion Assessment

Soil vapor samples will be collected from the 10 existing vapor points at the site and four additional soil vapor points installed along the sewer line as shown on Figure 8 to evaluate the preferential pathway migration and the potential for soil vapor intrusion of CVOCs into nearby residences. Sub-slab soil vapor and indoor air samples will be collected during the 2012-2013 heating season from up to five buildings as shown on Figure 8 (8, 14, 16, 18, and 20 Willow Street). Two additional basement air samples from 19 Willow Street will also be collected during the heating season. The operation of the existing sub-slab depressurization systems (SSDSs) in 9 and 17 Willow Street will be confirmed by on-site inspection.

Each sample will be collected using summa canister sampling procedures in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006. All air samples will be collected using 6-liter summa canisters equipped with pre-calibrated flow controllers. Soil vapor samples will be collected over a one hour period, while sub-slab and indoor air samples will be collected over a 24 hour period. Ambient air samples will be collected concurrently with soil vapor, sub-slab, and indoor air sampling. The canisters will be batch certified clean (in accordance with EPA Method TO-15) and under a vacuum pressure of no more than -25 inches of mercury (in Hg). Upon completion of sampling, each canister will be checked for final vacuum pressure and shipped to the laboratory for analysis of VOCs using USEPA Method TO-15.

2.3.2 Soil Vapor Point Installation

The locations of subsurface utility conduits, as marked by Dig Safe New York, were previously surveyed and added to the site basemap to evaluate potential preferential pathways for soil vapor migration (Figure 8). Four additional permanent soil vapor points will be installed adjacent to the sewer utility bedding materials at the locations shown on Figure 8 and based on utility markouts and discussions with the City of Cohoes

Department of Public Works. Soil vapor points will be installed using direct-push drilling methods to advance a borehole to an approximate depth of five feet bgs. Upon reaching the target depth, a six-inch small-diameter stainless steel screen attached to Teflon or Teflon-lined tubing will be lowered to the bottom of the borehole. The bottom one-foot of the borehole will then be backfilled with clean silica sand. The remaining borehole annulus will be backfilled to the surface with hydrated bentonite. The point will be completed with a flush mount casing.

2.3.3 Sub-Slab Point Installation

Sub-slab soil vapor samples will be collected from just below the concrete slab of each building through a small-diameter borehole drilled with a hammer drill. The procedures for temporary sub-slab soil vapor point construction are as follows:

- Core through the floor using a hammer drill.
- Drill into the sub-slab material to a depth of no more than two inches beneath the base of the concrete slab.
- Insert Teflon lined polyethylene tubing, suspending the end of the tube approximately ¼-inch above the bottom of the hole.
- Backfill the borehole with clean, coarse grained, silica sand up to the bottom of the concrete slab.
- Seal the temporary sample probe to the surface with bentonite or melted beeswax.
- Connect a three-way valve to the Teflon tubing (with valves closed). The three-way valve will be used to connect the vapor sampling point to the sampling train without allowing indoor air to mix with soil vapors.
- The sampling point and tubing will be purged at a rate of 0.2 liters per minute or less, using a syringe, until one to three sampling point volumes are removed.
- Upon completion of the sub-slab soil vapor sampling, all sampling equipment will be removed and the holes will be filled with cement.

2.3.4 Tracer Gas Testing

A tracer gas test will be performed in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, 2006) to confirm that the soil vapor probes were constructed in a manner that minimize the entrainment of ambient air into the soil vapor samples. Helium will be used as the tracer gas since it is non-toxic, non-reactive, and provides a sensitive response that can be monitored using a portable helium detector. Tracer gas testing will be performed at all proposed soil vapor and sub-slab sampling locations. A small plastic container will be placed over the sampling point, filled with helium, and measured using a helium detector to ensure 100 percent concentration of helium in the enclosure. A syringe will be used to purge the sampling tube into a Tedlar® bag which will be tested using the helium detector and a PID. If high concentrations (greater than 10 percent) of tracer gas are observed in the Tedlar® bag, the probe seal will be enhanced to reduce the infiltration of air. Once the probe seal's integrity is confirmed, the 6-liter sampling canister with a vacuum gauge and flow controller will be connected to the sample tubing and the point sampled.

2.3.5 Sampling

Prior to initiating indoor air or sub-slab soil vapor sampling, a pre-sampling inspection, including an inventory of the materials/chemicals used in each building will be conducted to identify any potential confounding sources. Interviews with building tenants and/or owners will also be conducted to gain a better understanding of each building. Interference from confounding sources can complicate the interpretation of indoor air sampling data and the evaluation of soil vapor intrusion pathways. Confounding sources could include material such as: paints, cleaning solvents, carpet and upholstery cleaners, lubricants, new furniture, new flooring, glues, and dry cleaned clothes. In addition to interference from confounding sources, indoor air samples can be affected by variability in building ventilation, changes in seasonal and weather conditions, and nature of the source. If confounding sources are identified during the pre-sampling inspections, consultation with the property owners will determine the most effective method for reducing the potential interferences from the confounding sources. Typically, the most effective method is to remove the sources from the area where air samples will be collected and request that tenants refrain from activities that impact indoor air quality during the time of sampling. To the extent practicable, confounding sources will be removed from the sampling areas a minimum of 24 hours prior to the start of the air sampling. Heating, ventilation and air-conditioning (HVAC) systems will be operated in a normal fashion throughout the sampling period as they would for a typical day. One

indoor air and one sub-slab sample will be collected from each building, approximately in the center of each basement.

All air samples will be collected using a Summa canister sampling train, which consists of a summa canister, flow controller, particulate filter, pressure gage, and associated fittings. All canisters will be batch-certified as analyte-free by the analytical laboratory prior to use. Flow regulators calibrated and supplied by the analytical laboratory will be used to allow for continuous sampling over the designated sampling period. Each flow regulator will be equipped with a filter to prevent particulate matter from entering the canister. The following procedure will be used for the collection of soil vapor, sub-slab, indoor, and outdoor air samples:

- Note the environmental conditions in the sample area on the sample collection sheet.
- Remove the brass fitting covering the 6-liter Summa canister sampling port using a wrench.
- Assemble the sampling train, connecting the flow controller with integral pressure gage to the Summa canister sampling port. Each fitting should be hand tightened and then tightened with a wrench approximately ¼ turn.
- Confirm that the sampling train is air tight by conducting a vacuum test. Place the brass cap at the end of the sampling train (particulate filter), quickly open and close the sampling valve and monitor the vacuum on the pressure gage. If the vacuum decreases, there is a leak in the system and the fitting should be rechecked and the vacuum test redone.
- Initiate sampling by opening the Summa canister valve. Record starting time and the vacuum within the canister on the sample collection sheet and canister identification tag.
- Check the sampling train pressure gage during the first hour of sampling to confirm that the air sampling is proceeding as planned.
- When the designated sampling time has elapsed since initiation of sampling, close the canister valve. Check the vacuum within the canister using the pressure gage and record the measurement on the sample collection sheet and canister identification tag.

- Since the flow rate into the canister can fluctuate due to variations in atmospheric conditions, the measured final vacuum may range from 2 to 12 inches of mercury (Hg). If the measured vacuum is greater the 12 inches of Hg or less than 1.0 inches of Hg, the sample may be flagged and re-sampling may be required.

- Disassemble the sampling train and place the brass cap on the sampling port of the canister and tighten. The air sampling is complete.

2.3.6 SVI IRM

If the NYSDEC and NYSDOH determine that mitigation systems are necessary based on the analytical results of the soil vapor intrusion sampling, SSDSs will be installed. Malcolm Pirnie will provide design and field oversight of construction services and will obtain quotations for the SSDS installation services in accordance with NYSDEC requirements.

2.4 Groundwater Sampling

2.4.1 Groundwater Monitoring Well Installation

Two overburden groundwater monitoring wells will be installed at the locations shown on Figure 8. One 1-inch diameter PVC groundwater monitoring well with flush-mount protective cover will be installed at one of the boring locations at 9 Willow St using direct-push drilling methods with a 10 foot screen to approximately 20 feet bgs. One 2-inch diameter PVC groundwater monitoring well with a 10 foot screen will be installed to a depth of approximately 20 feet bgs to replace MW-7 using hollow-stem auger drilling methods and will be completed with a flush-mount protective cover.

Three bedrock groundwater monitoring wells will be installed at the locations shown on Figure 8 using hollow-stem auger and rotary drilling methods. Each well will be constructed of 4-inch inner diameter (ID) PVC casing from ground surface to approximately five feet into competent bedrock (approximately 32 feet bgs) using 6 ¼" HSA to the top of bedrock and a 5- 7/8 inch O.D. roller bit with mud, water, or air rotary drilling techniques for the 5 foot rock socket. The wells will be completed to the final depth of approximately 45 feet bgs using either HQ wire-line rock coring techniques or NQ coring followed by 3- 7/8 inch O.D. roller bit to ream out the hole. All wells will be completed with flush-mount protective covers.

Upon completion, all new monitoring wells will be developed to minimize turbidity in groundwater samples collected from each well and to improve their hydraulic properties. Development water generated will be collected in UN-approved 55-gallon steel drums and staged at the site for pickup and disposal in accordance with federal, state, and local regulations.

2.4.2 Groundwater Sampling

At least one week after well development, groundwater samples will be collected from each new well and all existing wells. Prior to groundwater purging and sampling the depth to water and light non-aqueous phase liquid (LNAPL), if present, in each monitoring well will be measured using an oil/water interface probe and recorded. Groundwater sampling will be conducted in accordance with the USEPA Low-Flow/Low-Purge Sampling Protocol (USEPA, 1998). To the extent practicable, groundwater purging rates will be low enough to prevent significant drawdown of the groundwater level in the monitoring well. Water levels will be monitored during sampling to ensure that excessive draw down is not occurring. Each groundwater sample will be analyzed for TCL VOCs by USEPA Method 8260. One third of the samples will also be analyzed for TCL SVOCs by USEPA Method 8270, TAL metals by USEPA Methods 6010C and 7470A, PCBs by USEPA Method 8082, and pesticides by USEPA Method 8081.

To evaluate geochemical characteristics of the groundwater, and to evaluate the effectiveness of well purging, temperature, pH, oxidation-reduction potential, specific conductivity, turbidity, and dissolved oxygen were measured during purging and immediately prior to groundwater sampling.

2.5 Survey

Upon completion of the field investigation activities, the location and elevation of each new groundwater monitoring well installed during the RI and IRM field activities will be surveyed to the nearest 0.01-foot vertically and 0.1-foot horizontally and will be added to an AutoCAD base map for the site. The locations of the subsurface soil samples will also be surveyed to the nearest 0.1-foot horizontally and added to the AutoCAD base map.

2.6 Investigation-Derived Waste

Investigation derived wastes will be handled in accordance with the NYSDEC Proposed Decision TAGM Disposal of Contaminated Groundwater Generated During Site Investigations and the Final TAGM – Disposal of Drill Cuttings. Soil and groundwater will

be contained in U.N.-approved 55-gallon drums and staged at a central location at the site for pickup and disposal as an F002 hazardous waste in accordance with federal, state, and local regulations.

3. Reporting

The results of the investigation activities will be provided to the NYSDEC in a Remedial Investigation (RI) report prepared based upon "DER-10 Technical Guidance for Site Investigation" (DER-10) (NYSDEC, 2010) and submitted to the NYSDEC for review and comment. The report will include the following:

- Discussion of field investigation activities and technologies.
- Discussion of the physical characteristics of the site, including groundwater flow patterns.
- Presentation of analytical results for all media sampled.
- Quality assurance/quality control evaluation of the analytical data including the results of the data quality review.
- Discussion of the nature and extent of contaminants.
- Comparison of analytical results to background concentrations and applicable regulatory standards and objectives.
- Supporting data, including analytical data packages, field log forms, and monitoring well construction diagrams.

4. Schedule

The estimated project schedule is presented on Figure 9. The actual schedule will be dependent on subcontractor availability, site access, and the date of project initiation (Notice to Proceed).

The schedule does not account for delays due to unforeseen site conditions (e.g., inclement weather, access to site or adjacent properties). Every attempt will be made to adhere to the schedule presented. Unexpected delays will be documented and reported to the NYSDEC in a timely fashion. In the event that the schedule needs to be modified, Malcolm Pirnie will contact the NYSDEC for approval of the updated schedule. .

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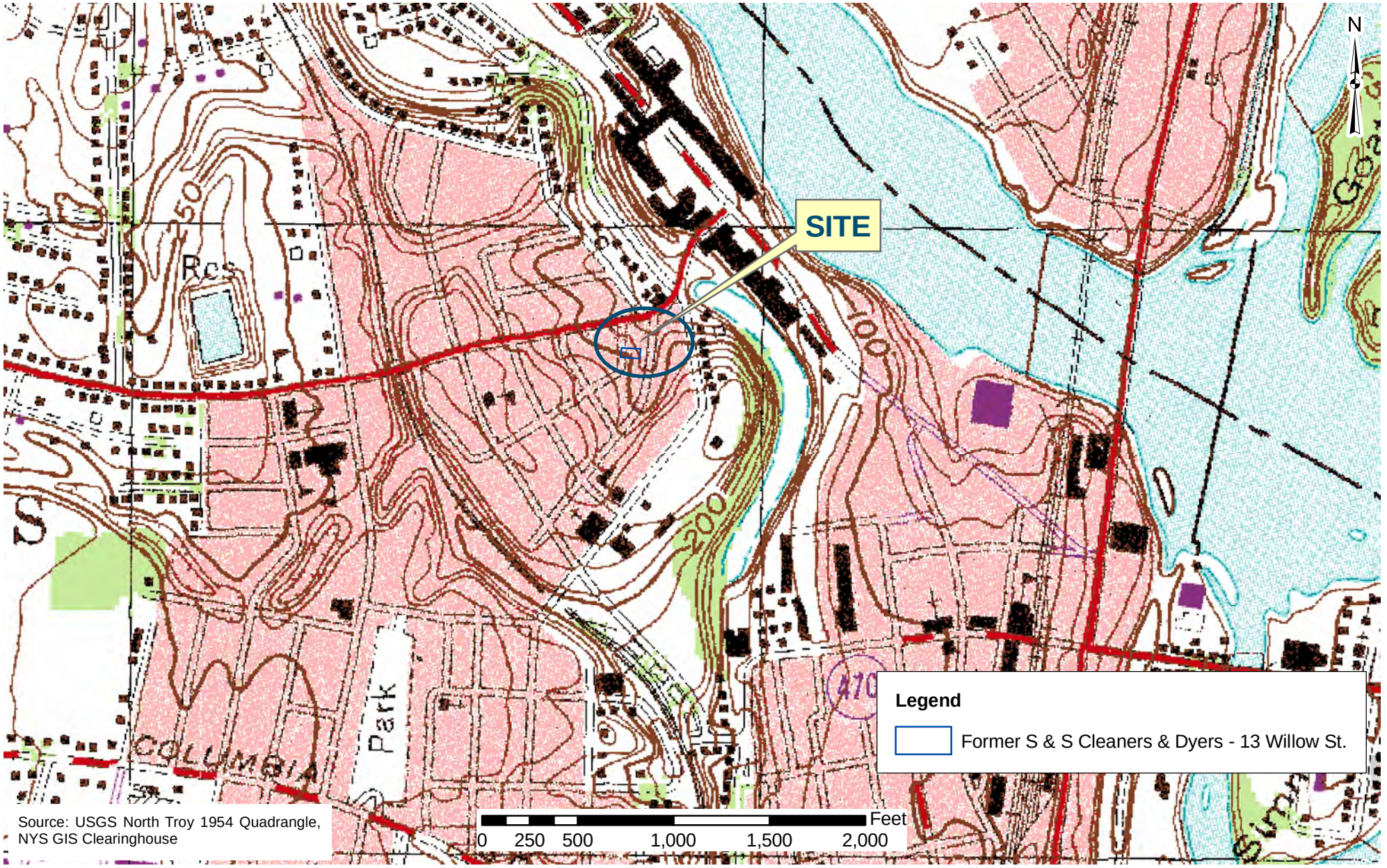
Figures



G:\GIS\MOD\00266396.0000\Figures\Figure 1 Site Location.mxd

ARCADIS MALCOLM PIRNIE

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORMER S & S CLEANERS & DYERS
13 WILLOW STREET, COHOES, NEW YORK
SITE # 401063

SITE LOCATION

ARCADIS U.S., INC.

AUGUST 2012

FIGURE 1

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ARCADIS MALCOLM PIRNIE

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

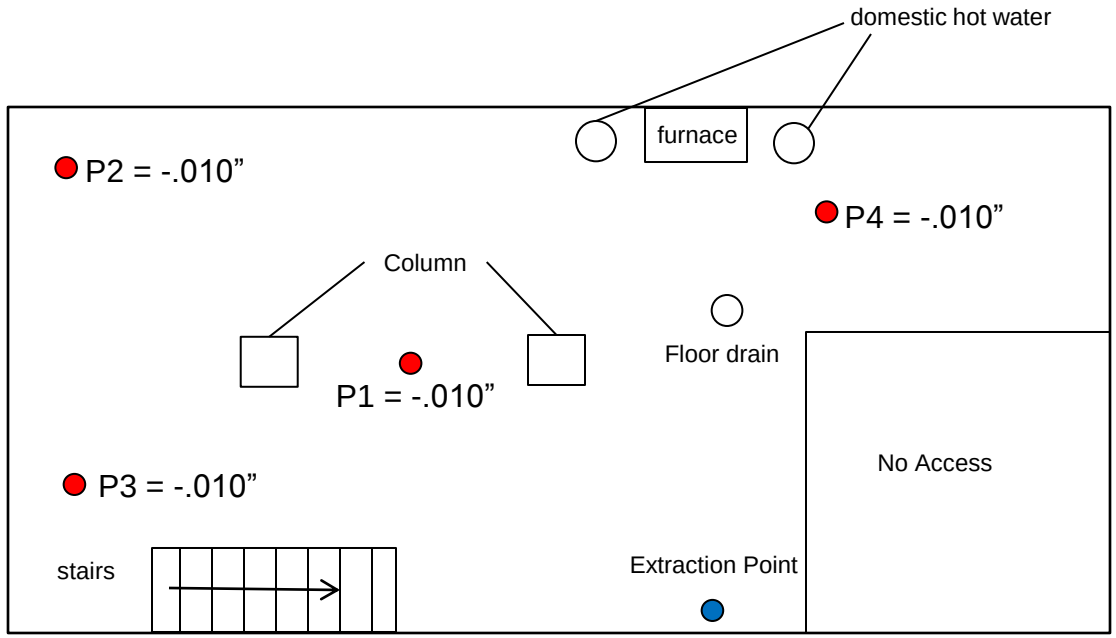
FORMER S & S CLEANERS & DYERS
13 WILLOW STREET, COHOES, NEW YORK
NYSDEC SITE # 401063

AERIAL PHOTOGRAPH

ARCADIS U.S., Inc.

AUGUST 2012

FIGURE 2



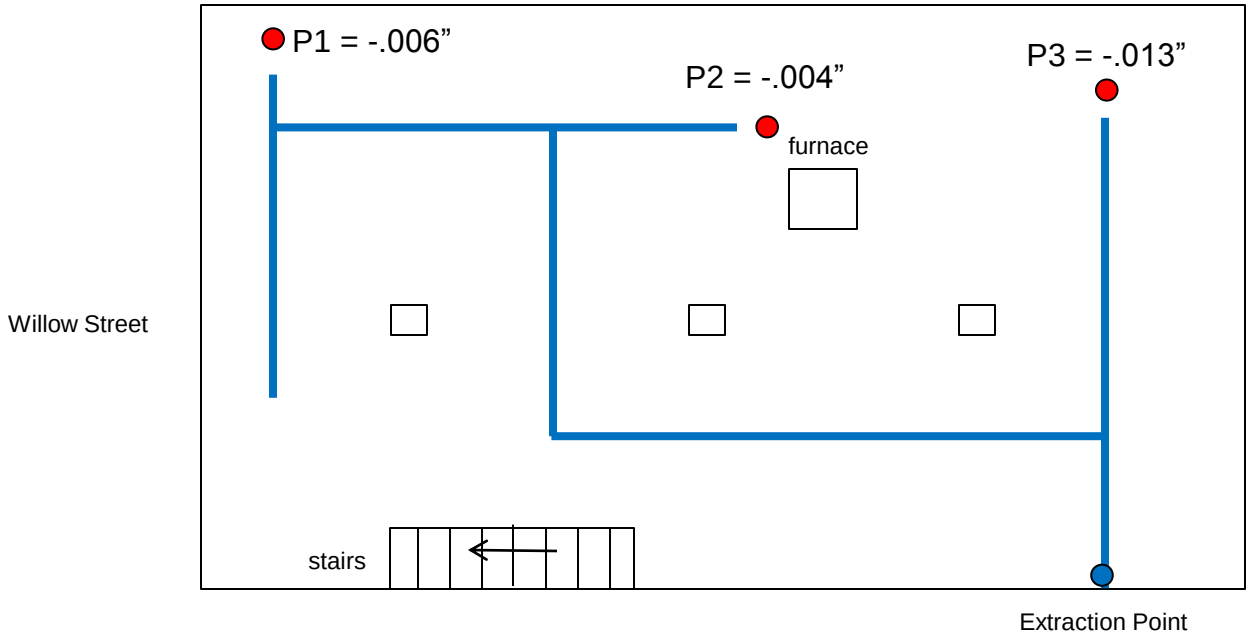
System Vacuum Pressure = 1.1”

NOTE: Figure not drawn to scale.

Pressure Monitoring Point ●

Micro-manometer Reading (Inches of Water) P1 = -.010”

ARCADIS MALCOLM PIRNIE	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION FORMER S & S CLEANERS AND DYERS 13 WILLOW STREET, COHOES, NEW YORK SITE # 401063	**9 WILLOW STREET – MITIGATION SYSTEM TESTING 11/15/10**	AUGUST 2012 **FIGURE 3**



NOTE: Figure not drawn to scale.

System Vacuum Pressure = 0.5”

Pressure Monitoring Point

Micro-manometer Reading (Inches of Water) P1 = -.006”

Extraction Piping

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NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORMER S & S CLEANERS AND DYERS
13 WILLOW STREET, COHOES, NEW YORK
SITE # 401063

17 WILLOW STREET – MITIGATION SYSTEM TESTING 11/15/10

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FIGURE 4

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FORMER S & S CLEANERS AND DYERS
13 WILLOW STREET, COHOES, NEW YORK
SITE # 401063

SUMMARY OF CHLORINATED VOLATILE ORGANIC COMPOUND ANALYTICAL RESULTS - SOIL

MALCOLM PIRNIE, INC.

AUGUST 2012

FIGURE 5

Map Document: (S:\GIS_Resources\Standards_Guidelines\Map Templates\GIS_TEMPLATES_2005\11x17_Landscape.mxd)
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MW-8 Compound	5/27/10	11/15/10
PCE	7	ND
TCE	14	ND
cis-1,2-DCE	5	2.4
trans-1,2-DCE	1	ND

MW-5	3/9/09	11/18/09
CVOCs	ND	ND

MW-7 Compound	5/27/10	5/27/10 Dup	11/15/10
PCE	51,000 D	58,000 D	130,000 DJ
TCE	210 D	200 D	230 D
1,1-DCE	7 J	7 J	11
cis-1,2-DCE	56 J	57 J	100 D
trans-1,2-DCE	1 J	1 J	1.6
Vinyl Chloride	3	3	8
Chlorobenzene	6.2 J	5.9 J	9.7
1,2-Dichloropropane	2 J	3 J	3.8

MW-6 Compound	5/27/10	11/15/10
PCE	ND	1.2 J

MW-1	3/9/09	11/18/09
CVOCs	ND	ND

MW-4	3/9/09	11/18/09
CVOCs	ND	ND

MW-2 Compound	3/9/09	3/9/09 Dup	11/18/09	11/18/09 Dup
PCE	18	14	17	25

MW-3	3/9/09	11/18/09
CVOCs	ND	ND

NOTE: Groundwater CVOC concentrations for detected compounds given in µg/L.

= Concentration exceeds corresponding NYSDEC Class GA Standard.

ARCADIS MALCOLM PIRNIE
Infrastructure Water Environment Buildings

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER S & S CLEANERS AND DYERS
13 WILLOW STREET, COHOES, NEW YORK
SITE # 401063

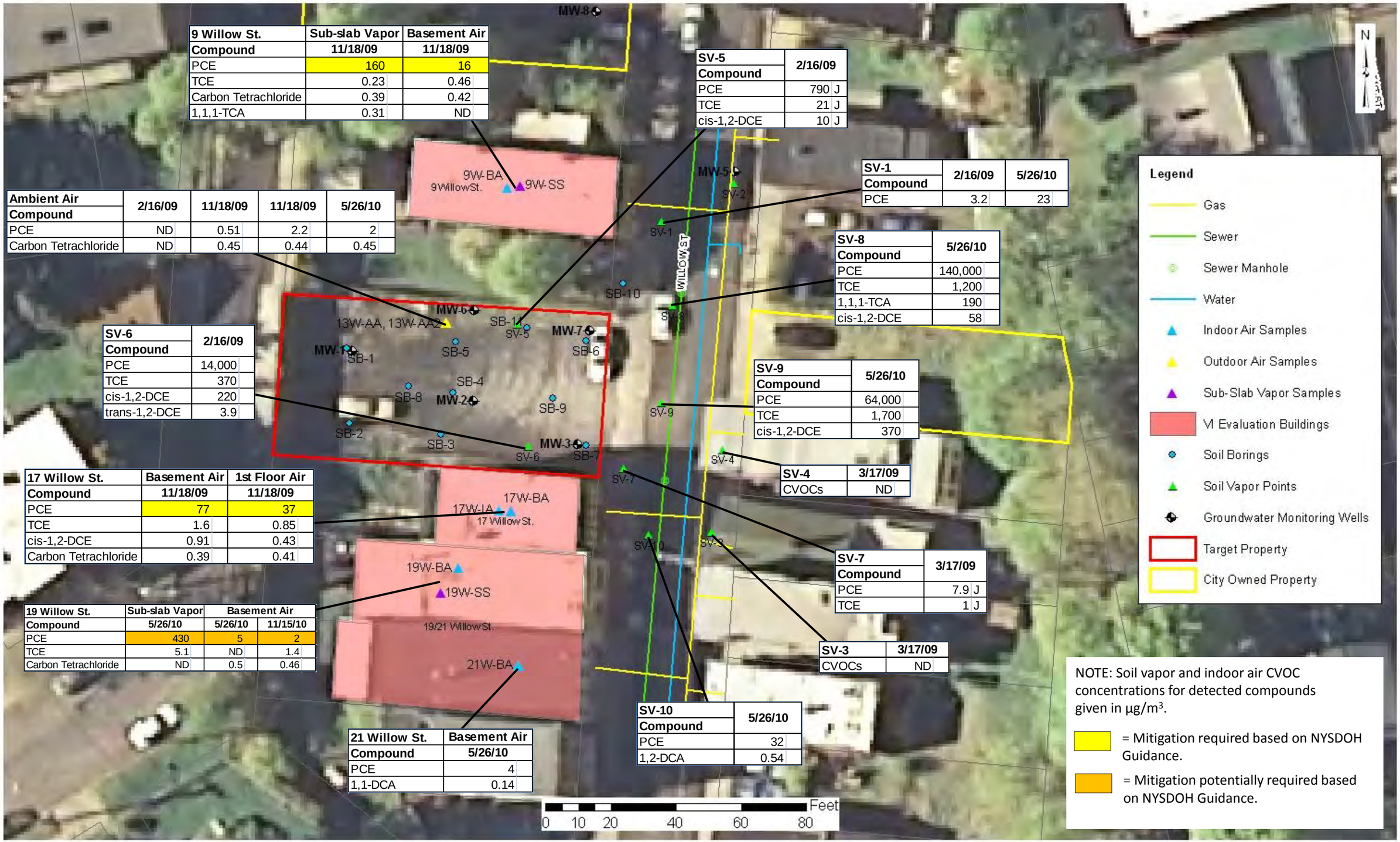
SUMMARY OF CHLORINATED VOLATILE ORGANIC COMPOUND ANALYTICAL RESULTS - GROUNDWATER

MALCOLM PIRNIE, INC.

AUGUST 2012

FIGURE 6

Map Document: (S:\GIS_Resources\Standards_GIS\Mxd Map Templates\GIS_TEMPLATES_2005\11x17_Landscape.mxd) 7/19/2005 – 5:27:24 PM



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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER S & S CLEANERS AND DYERS
13 WILLOW STREET, COHOES, NEW YORK
SITE # 401063

SUMMARY OF CHLORINATED VOLATILE ORGANIC COMPOUND ANALYTICAL RESULTS – SOIL VAPOR AND INDOOR AIR

MALCOLM PIRNIE, INC.

AUGUST 2012

FIGURE 7

Map Document: (G:\GIS_Resources\Standards_GIS\Mxd Templates\GIS_TEMPLATES_2005\Mxd\17_Landscape.mxd)
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G:\GISMOD\00266396.0000\Figures\Proposed Sample Locations.mxd

ARCADIS MALCOLM PIRNIE

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORMER S & S CLEANERS & DYERS
13 WILLOW STREET, COHOES, NEW YORK
NYSDEC SITE # 401063

PROPOSED SAMPLING LOCATIONS

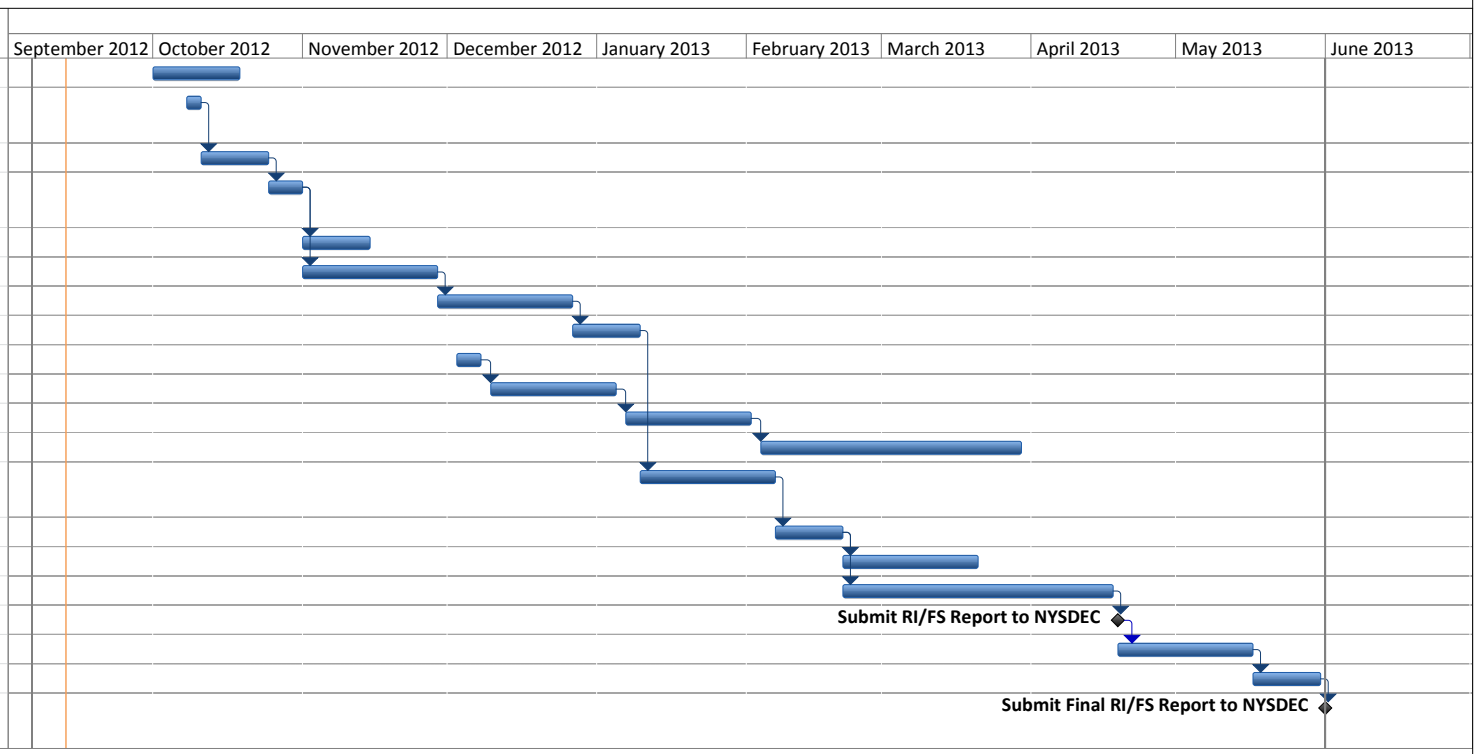
ARCADIS U.S., Inc.

AUGUST 2012

FIGURE 8

Figure 9
Anticipated Project Schedule
Remedial Investigation
Former S & S Cleaners and Dyers Site
Cohoes, New York

ID	Task Name	Duration
1	Obtain Drilling Permits	14 days
2	Evaluate Current Conditions (Existing GW & SV Sampling)	3 days
3	Analysis of Samples	10 days
4	Geoprobe Drilling (Soil, GW, & SV Sampling)	5 days
5	Analysis of Samples	10 days
6	Soil IRM Design	20 days
7	Soil IRM Bidding & Contracting	20 days
8	Soil IRM	10 days
9	SVI Evaluation	5 days
10	Analysis of Samples	20 days
11	Data Validation	20 days
12	SVI IRM (if necessary)	40 days
13	Groundwater Well Installation & Sampling	20 days
14	Analysis of Samples	10 days
15	Data Validation	20 days
16	Prepare RI/FS Report	40 days
17	Submit RI/FS Report to NYSDEC	1 day
18	NYSDEC Review of RI/FS Report	20 days
19	Revise RI/FS Report	10 days
20	Submit Final RI/FS Report to NYSDEC	1 day



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Appendix A

SSDS Photographs and System Information – 9 and 17 Willow Street

Alpine Environmental Services, Inc.

September 08, 2010

LOCATION
9 Willow Street
Cohoes, NY

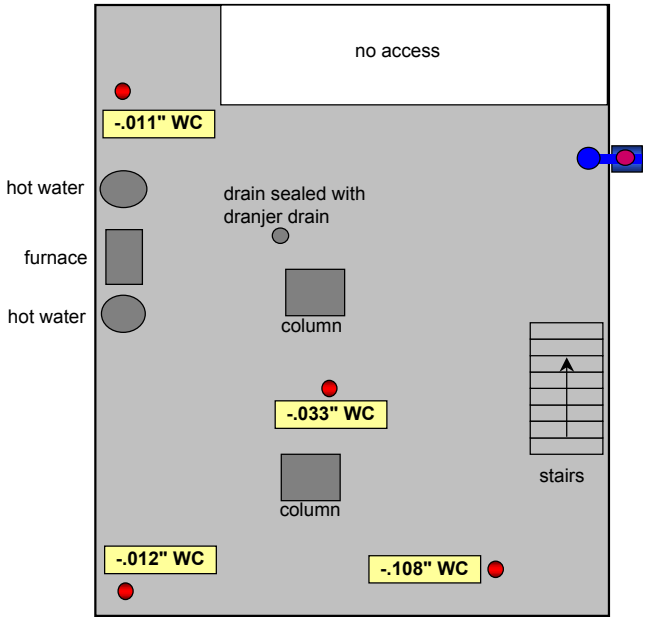
Fan: Radonaway RP145
Pressure: 1.1" WC
Extraction Points: 1

LEGEND

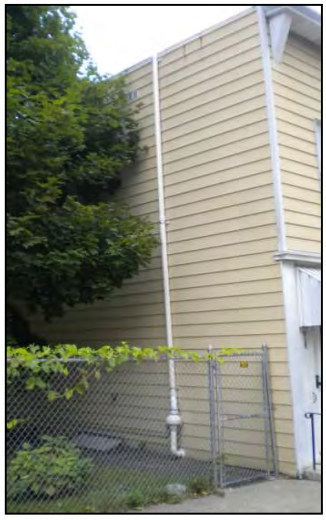
- extraction (suction) point
- exhaust pipe
- Extraction fan
- Extraction piping
- communication testing point
- **-.004" WC** micro manometer reading: reading in negative inches of water column

Soil Vapor Mitigation System

Willow Street



extraction fan and electrical disconnect



exterior piping

extraction point

manometer and labels

Alpine Environmental Services, Inc.

September 09, 2010

LOCATION
17 Willow Street
Cohoes, NY

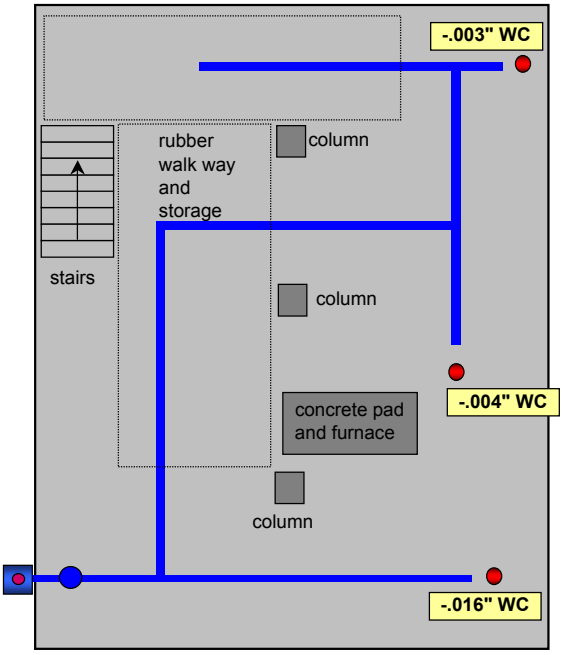
Fan: Radonaway RP265
Pressure: 0.6" WC
sub-membrane depressurization

LEGEND

- extraction (suction) point
- exhaust pipe
- Extraction fan
- Extraction piping
- communication testing point
- **-.004" WC** micro manometer reading: reading in negative inches of water column

Soil Vapor Mitigation System

Willow Street




manometer and labels


EPDM membrane


EPDM membrane


electrical panel and kilowatt meter


extraction fan and electrical disconnect


exterior piping

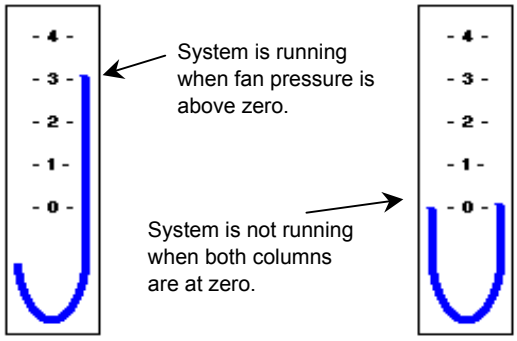
Alpine
Environmental
Services, Inc.

Soil Vapor Mitigation System Instructions

The Soil Vapor System is a maintenance free system.

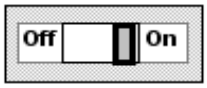
For the Soil Vapor System to work properly it must be running at **ALL** times.

Periodically check your Soil Vapor Systems manometer to verify the system is running. The manometer displays the fan pressure.

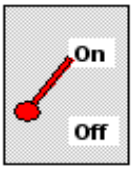


If the system is not running check the following:

1.) Verify circuit breaker did not trip, located in electrical panel



2.) Verify fan switch is on, located adjacent the fan.



If system is still not running contact
Alpine Environmental Services, Inc.
(518) 453-0146